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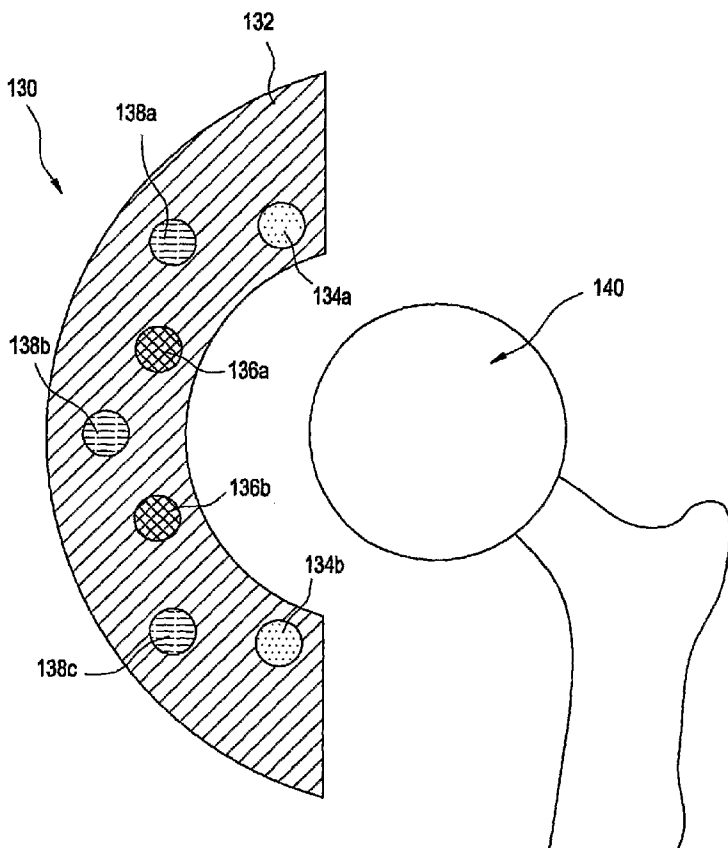
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[Continued on next page]

(54) Title: PASSIVE WEAR-INDICATING SENSOR FOR IMPLANTABLE PROSTHETIC DEVICE



(57) Abstract: A method is provided for non-invasively detecting mechanical wear of a prosthetic device implanted in a patient, the method comprises using a non-invasive imaging technique to image the prosthetic device that includes a wear indicating composition; and detecting whether the wear indicating composition has been released from the prosthetic device, and, if so, the location, type, and/or amount thereof. The implant device includes a prosthetic device body (132) having at least one outer surface area; at least one reservoir (134, 136, 138) (e.g., a plurality of discretely spaced micro-reservoirs) in the device body; a wear indicator composition disposed in said at least one reservoir, wherein mechanical wear of the at least one outer surface area of the device body in vivo causes release of at least part of the wear indicator composition. The prosthetic device body may be one for replacement of a hip, a knee, a shoulder, an elbow, or a vertebra.

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ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/040314

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61F2/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61F A61K A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/040806 A1 (MACDONALD STUART G [US]) 27 February 2003 (2003-02-27) paragraph [0017] - paragraph [0021] paragraph [0026] paragraph [0033] - paragraph [0034] figure 1	1-4, 10-12
A	US 2002/115944 A1 (MENDES EMANUEL [IL] ET AL) 22 August 2002 (2002-08-22) paragraph [0106] - paragraph [0116] figures 8,9	1-12
A	US 5 935 171 A (SCHNEIDER JOHN E [US] ET AL) 10 August 1999 (1999-08-10) column 3, line 58 - column 5, line 59 figures 1-4	1-12
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

9 February 2007

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2005/039440 A2 (DEPUY PRODUCTS INC [US]; DISILVESTRO MARK R [US]; DIETZ TERRY [US]; SH) 6 May 2005 (2005-05-06) abstract page 21, line 22 - page 22, line 2 figure 1 -----	1-12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/040314

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 22-29
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-12, 30

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-12,30

A medical implant device having a mechanical wear detector comprising:
a prosthetic device body having at least one outer surface area;
at least one reservoir in the device body; and
a wear indicator composition disposed in said at least one reservoir,
wherein mechanical wear of the at least one outer surface area of the device body in vivo causes release of at least part of the wear indicator composition.

2. claims: 13-21

An orthopaedic implant device for controlled local release of a beneficial substance in vivo comprising:
a device body which comprises a release system which includes at least one beneficial substance,
wherein the beneficial substance is releasable from the device in vivo upon mechanical wear of at least one surface of the device body.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/040314

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003040806	A1	27-02-2003	AU 2002326669 A1 10-03-2003 WO 03017821 A2 06-03-2003
US 2002115944	A1	22-08-2002	NONE
US 5935171	A	10-08-1999	NONE
WO 2005039440	A2	06-05-2005	EP 1648354 A2 26-04-2006 US 2005010301 A1 13-01-2005